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10/045,060	01/15/2002	Mutsumi Kimura	111668	2963

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EXAMINER

QI, ZHI QIANG

ART UNIT PAPER NUMBER

2871

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,060

Applicant(s)

KIMURA, MUTSUMI

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 and 10-27 is/are rejected.
- 7) ☒ Claim(s) 4, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 1 and 3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.**

Claims 1 and 3 under 35 U.S.C. 112 first paragraph rejection are contingent upon the language “an electro-optical device comprising pixels, each pixel including: an electroluminescence element and a liquid crystal element” in claim 1, and “an electro-optical device comprising: a layer including switching element; a layer including an electroluminescence element; and a layer including a liquid crystal element” in claim 3. Because according to the examiner’s understanding an electro-optical device must have various elements together to build the device and have the structure’s relationship, and that this is impossible for an electro-optical device just having the major elements as an electroluminescence element and a liquid crystal element, or just have a liquid crystal element, an electroluminescence element and a switching element, and those elements (such as an electroluminescence element and a liquid crystal element) do not describe the structure’s relationship and how to build the electro-optical device. Concerning the

Art Unit: 2871

limitation "the layer including the electroluminescence element and the layer including the liquid crystal element being placed above the layer including the switching element" in claim 3, that should be separated from the limitation "a layer including a liquid crystal element" and describe the structure's relationship clearly according to the embodiment of Fig.1.

Therefore, such claims with this interpretation are not enabled. Further, even if applicant had enabled one perfect device, applicant had not enable all possible device having an electroluminescence element and a liquid crystal element and switching element.

Therefore, such claims are broader than the enablement.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 23 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23 and 25, concerning a method for driving an electro-optical device in which "measuring a predetermined physical quantity, and setting a usage condition. . ." is not definite. Because such claims cannot tell what the physical quantity is referred to. Further, such claims cannot tell how to set a usage condition. According to the examiner's understanding that is interpreted as a device tests the light intensity such as a light signal level and using the signal level to set an element such as an electroluminescence element being in conducting state or being in non-conducting state.

Claims 23 and 25 have the same limitations, and one of the claims is redundant.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-2, 10 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,025,894 (Shirasaki et al).

Claims 1-2, 10 and 17, Shirasaki discloses (col.7, line 17 – col. 17, line 4; Fig.1) a display apparatus (11), i.e., an electro-optical device, comprising pixels and each pixel including:

- an electroluminescence element (EL) (12);
- a liquid crystal element (22);
- switching element (TFTs) (34) that is controlled to be in ON state or OFF state by selecting voltages applied.

7. Claim 3 is rejected under 35 U.S.C. 102(e) as being anticipated by US 6,556,260 (Itou et al).

Claim 3, Itou discloses (col.5, line 31-col.12, line 59; Fig.1) that a reflective liquid crystal display apparatus comprising:

Art Unit: 2871

- a layer including switching element such as the TFTs (46);
- a layer including an electroluminescence element such as an EL device (31) having light emission layer (131);
- a layer including a liquid crystal element (10);
- the layer including the electroluminescence element such as the (EL) device (31) and the layer including the liquid crystal element (10) being placed above the layer including the switching element such as the TFTs (46).

8. Claims 23 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,133,976 (Kimura).

Claims 23 and 25, Kimura discloses (col. 20, line 46 – col.21, line 14; Fig.35) that a method of driving an electro-optical device in which using a selection pulse of a row selection signal (Vg), information of a “1” level or a “0” level is written from an information signal Vd into TR1 of an MOS-FET, such that if the information signal measured is ‘1” level, the device TR2 goes to conducting state, then the EL layer (70) goes to conducting state, so that the EL layer emits light; and if the information signal measured is ‘0” level, the device TR2 goes to non-conducting state, then the EL layer (70) goes to non-conducting state, so that the EL layer does not emits light.

Therefore, Kimura met the limitations as claimed in claims 23 and 25.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2871

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5-7,11-16,19-22 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki as applied to claims 1-2,10 and 17 above, and further in view of US 0158823 (Zavracky et al), US 6,133,976 (kimura) and US 5,610,628 (Yamamoto et al).

Claim 5, Shirasaki does not expressly disclose the switching element controlling the electroluminescence element or the liquid crystal element.

However, concerning the switching element controlling the electroluminescence element or the liquid crystal element that is common and known in the art. Because the switching element such as the TFTs having switching property to be set in ON state or OFF state and controlling the liquid crystal material rotates the polarized light and controlling the electroluminescence element to be set in ON state or OFF state.

Zavracky discloses (col.1, paragraph 0004) when a particular pixel of the display turned on by the TFTs, the liquid crystal material rotates polarized light being transmitted through the material so that the light will pass through the second polarizing filter. That is a basic principle using TFTs to control the light passing through the liquid crystal material and to display the image, and that would have been at least obvious for obtaining an image display.

Claim 6, Shirasaki discloses (col.1, lines 18 – 43) that the LCD can be reflective LCD. Because the reflective LCD uses in the daylight with bright outside light (in a bright environment) can obtain good contrast display and suppress power consumption.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use reflective liquid crystal as claimed in claim 6 for obtaining good contrast display and suppress power consumption.

Claim 21, Shirasaki does not expressly disclose the liquid crystal being a super twisted nematic liquid crystal having a twist angle of 180 degree or more.

However, Yamamoto discloses (col.2, lines 7-18) that an STN (super twisted nematic) LCD is generally used for achieving the sharpness of the display (high contrast), and in the STN LCD, the liquid crystal molecules are twisted through an angle of 180 to 270 degree.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use super twisted nematic liquid crystal having a twist angle of 180 degree or more as claimed in claim 21 for achieving a high contrast display.

Claim 7, Shirasaki discloses (col.13, line 64 – col.14, line 3) that in a dark environment there is insufficient amount of outside light, the organic EL device (12) is activated to be in a luminescent state. Therefore, the luminance of the electroluminescence element (EL) is controlled in a dark place. Shirasaki discloses (col.13, lines 2-24) that under a bright environment which provides a sufficient amount of outside light, the organic EL device (12) is disabled to be in a non-luminescent state, and the linearly polarized light is polarized in accordance with the voltage applied between the electrodes (25) and (30) by the birefringence effect of the liquid crystal (22). Therefore, the luminance of the liquid crystal element is controlled in a bright place.

Claims 11-13, concerning each pixel including sub-pixels that was common and known in the art as the color display having sub-pixels (R,G,B) for the color image display. Shirasaki discloses (Fig.1) each pixel having organic EL (12) element and liquid crystal (22) element, so that each sub-pixel would also have organic EL element and liquid crystal element. Shirasaki also discloses (Fig.1) that using switching element such as TFTs (34) being controlled to be in ON state or OFF state by the scanning signal, and the gray level must be corresponding to an average luminance of the pixel. Because the gray level is a signal level representation of an image data, and that would be converted in the digital processing, and that would have been at least obvious.

Claims 14-16, Kimura discloses (col.20, lines 33-35) that the picture element circuit can be a circuit having memory functions such as an SRAM. Therefore, each pixel would include a static RAM and the video signal can be held in the RAM circuit, and inherently, the scanning only need to be performed when the displayed data (the video signal) is changed, because the video signal was held in the RAM. Therefore, the display would save more power consumption. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange each pixel having a static RAM as claimed in claims 14-15 for achieving the result of scanning being performed only when the displayed data changed and save more power consumption.

Claims 19-20, Shirasaki discloses (col.4, lines 23 – 35; col.7, line 44 –col.11, line 49) that the EL material is a organic polymer material such as a mixture of poly(N-vinylcarbazole, etc., and such organic EL material can be formed very thin and emit light of sufficient luminance with a relatively low applied voltage.

Claim 22, the limitation is only given weight as intended use. Because any electro-optical device can be used as a display unit.

Claims 26-27, Shirasaki does not expressly disclose that a device that provides a signal to set a usage condition for the liquid crystal element and the organic EL element.

However, a device such as using a switching device to receive a signal turns a switching element switched the conducting state ON or OFF, so that to control the operation mode of the liquid crystal element or the EL element, that is common and known in the art.

Kimura discloses (col. 20, line 46 – col.21, line 14; Fig.35) that a method of driving an electro-optical device in which using a selection pulse of a row selection signal (V_g), information of a "1" level or a "0" level is written from an information signal V_d into TR1 of an MOS-FET, such that if the information signal measured is '1' level, the device TR2 goes to conducting state, then the EL layer (70) goes to conducting state, so that the EL layer emits light; and if the information signal measured is '0' level, the device TR2 goes to non-conducting state, then the EL layer (70) goes to non-conducting state, so that the EL layer does not emits light.

Since Kimura discloses a method how to measuring a information signal such as the light intensity signal as '1' level or '0' level and setting the EL layer a usage condition to emit light or not to emit light, and using switching device such as TR1 and TR2 to provide the information signal so as to set the usage condition for the EL element. Therefore, the electronic apparatus using such control method and control

Art Unit: 2871

device would reduce the power consumption and light usage more efficiently between the dark environment and the bright environment.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use such switching control device as claimed in claims 26-27 for reducing the power consumption and light usage more efficiently.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki as applied to claims 1-2, 10 and 17 above, and further in view of US 6,162,667 (Funai et al).

Claim 18, Shirasaki does not expressly disclose the TFT being polycrystalline silicon produced by a low-temperature process of 600°C or less.

However, Funai discloses (col.18, lines 18-29) that by using a polycrystalline silicon film forming of high performance TFTs having a high mobility and a high ON/OFF ratio can be realized with a low-temperature process such as 550°C.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use polycrystalline silicon forming TFTs by a low-temperature process as claimed in claim 18 for obtaining a high performance TFTs.

12. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura as applied to claims 23 and 25 above, and further in view of US 6,025,894 (Shirasaki et al).

Claim 24, Kimura does not expressly disclose the plurality of types of electro-optical elements including a luminescent element and a liquid crystal element.

However, Shirasaki discloses (col.7, line 16 – col.17, line 4;Fig.1) that the

Art Unit: 2871

plurality of types of electro-optical element including a luminescent element (EL) (12) and a liquid crystal element (13), and the EL element (12) would be active to emit light in dark environment to increase the visibility, and the EL element (12) would be disabled not to emit light and using the reflection LCD to increase the display contrast, and the display apparatus would reduce the power consumption.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a luminescent element and a liquid crystal element as claimed in claim 24 for reducing the power consumption.

Allowable Subject Matter

13. Claims 4, 8 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches an electro-optical device comprising various elements as claimed, more specifically, as the following:

both of the electroluminescence element (EL) layer and the liquid crystal element (LC) layer being placed above the switching element layer, and the liquid crystal element being placed above the electroluminescence element layer [claim 4, as shown in Fig.1];

one electrode of the electroluminescence element (EL) and one electrode of the liquid crystal display element (LCD) being common, i.e., the EL element and the LCD element share one electrode such as the pixel electrode (23) as shown in Fig.1 [claim 8, as shown in Fig.1];

the other electrode of the electroluminescence element (EL) and a reflector of the liquid crystal display element (LCD) being common, i.e., the EL element and the LCD element share one electrode such as the underlay electrode (23) made of reflective metal as shown in Fig.1 [claim 9, as shown in Fig.1];

The closest references such as US 6,025,894 (Shirasaki et al) and US 6,133,976 (kimura) disclose an electro-optical device comprising electroluminescence element, liquid crystal element and switching element, but the prior art of record do not disclose such electro-optical device having both of electroluminescence element (EL) and liquid crystal element(LC) located above the switching element, and the EL element share the electrodes with the liquid crystal element (LC) as shown in Fig.1.

Conclusion

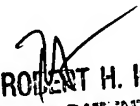
15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213.

Art Unit: 2871

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mike QI
August 21, 2003


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SUPERVISORY PATENT EXAMINER
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